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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/563,519

06/20/2006

Ofer Sneh

020008.0112PTUS

8637

24283 7590 01/06/2009
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EXAMINER

CHEN, KEATH T

ART UNIT

PAPER NUMBER

1792

MAIL DATE

DELIVERY MODE

01/06/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/563,519	Applicant(s) SNEH, OFER	
	Examiner KEATH T. CHEN	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 November 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 12-15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/24/2008 has been entered.

Response to Amendment

1. The claim amendment filed on 11/24/2008, addressing claims 1-11 and 16 rejection from the first office action (06/05/2008), by amending claims 1, 5, and 16 is acknowledged and will be addressed below.

Election/Restrictions

2. Claims 12-15 remain withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Invention Groups II and III, there being no allowable generic or linking claim.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35 U.S. Code not included in this action can be found in a prior Office action.

3. **Claims 1, 3-5, 7-11, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bhatnagar et al. (US 6391146, hereafter '146), in view of Halsey et al. (US 6663025, hereafter '025) and Heinze (US 2028603, hereafter '603).**

Art Unit: 1792

4. '146 teaches the limitations of:

5. Claim 1: A sub-atmospheric downstream pressure control apparatus (Fig. 4, abatement system #200, col. 8, line 26, part of the system of Fig. 1, including the throttle valve #82), characterized by: a pressure control chamber (PCC) (exhaust tube #85, similar to exhaust tube shown in various figures in instant application) located in serial fluidic communication downstream from said first FRE; a gas source (one of the #235, col. 7, lines 37-40); and a flow controlling device (one of the control valve #240) in serial fluidic communication downstream from said gas source and upstream from said PCC.

6. Claim 5 (besides the limitations of claim 1): A wafer processing apparatus comprising a process chamber (Fig. 1, #25), said apparatus characterized by; a process reactive gas supply line (line connects between #70 and nozzle #72) from a process gas source (#70, col. 3, lines 36-38) in serial fluidic communication upstream from said process chamber; an upstream flow control device (the valve as shown in Fig. 1, not labeled) located in serial fluidic communication upstream from said process chamber and downstream from said process gas source.

7. Claim 16: A sub-atmospheric downstream pressure control apparatus (Fig. 4, abatement system #200, col. 8, line 26, part of the system of Fig. 1, including the throttle valve #82), comprising: (b) a pressure control chamber (PCC) (#210, gas energized reactor) located in serial fluidic communication downstream from said first FRE; (d) a gas source (one of the #235, col. 7, lines 37-40); (e) a flow controlling device (one of the control valve #240) in serial fluidic communication downstream from said

Art Unit: 1792

gas source and upstream from said PCC; (f) a reactive gas source (the second #235, col. 8, lines 12-13) connected in serial fluidic communication upstream from said PCC; and (g) an abatement element (#226a-b, electrode) located within said PCC.

8. Claims 4 and 8: A sub-atmospheric downstream pressure control apparatus as in claim 1 (or 5) wherein a process chamber (Fig. 1, #25) is located in serial fluidic communication upstream from said first FRE (#82); said process chamber and said PCC (#85) are formed as compartments within a single process vessel (#200, #85, and wall of chamber #25 are connected into a single vessel); and said first FRE (#82) is formed within the partition between said process chamber (#25) and said PCC (#85).

9. Claim 9: A sub-atmospheric downstream pressure control apparatus as in claim 5 wherein said process is LPCVD (col. 12, line 35, col. 3, line 39, low pressure).

10. Claim 10: A sub-atmospheric downstream pressure control apparatus as in claim 5 wherein said process is RIE (col. 4, line 4 and col. 3, line 40, plasma etching is RIE).

11. Claim 11: A sub-atmospheric downstream pressure control apparatus as in claim 5 wherein said process is PECVD (col. 3, line 40).

12. For claims 9-11, applicant's claim requirements "LPCVD", "RIE", and "PECVD" are considered intended use in the pending apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter, 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of

Art Unit: 1792

performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto, 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).

13. '146 does not teaches the limitations of:

14. Claim 1: a first flow restricting element (FRE), wherein said first FRE is an immobile flow restricting element; a second FRE located in serial fluidic communication downstream from said PCC, wherein said second FRE is an immobile flow restricting element.

15. Claim 5: a first flow restricting element (FRE) located in serial fluidic communication downstream from said process chamber, wherein said first FRE is an immobile flow restricting element; a second FRE located in serial fluidic communication downstream from said PCC, wherein said second FRE is an immobile flow restricting element.

16. Claim 16: (a) a first flow restricting element (FRE) (throttle valve #82, Fig. 1), wherein said first FRE is an immobile flow restricting element; (c) a second FRE located in serial fluidic communication downstream from said PCC, wherein said second FRE is an immobile flow restricting element; .

17. '025 is an analogous art in the field of manufacturing of semiconductor devices using plasma (field of the invention; similar to '146, col. 1, lines 53-56 and col. 3, line 13), particularly in rapid cycling of venting and pumping gas (col. 2, lines 39-41; similar

Art Unit: 1792

to '146 effluent gas treatment, abstract). '025 teaches an immobile diffuser/flow restrictor (#200, Fig. 4A or 4B) at the bottom of the chamber (see Fig. 3A).

18. '603 is an analogous art in the field of turbo pump (title, right col. of page 2, line 40). '603 teaches a screen/flow restricting element (#44, Fig. 7, right col. of page 2, lines 65 to 75).

19. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have added a diffuser/first immobile flow restrictor, as taught by '025, to the bottom of chamber in Fig. 1 or 146, or upstream of Fig. 4 of '146. This diffuser/immobile flow restrictor would have been the first FRE. Furthermore, to have added a screen in front of pump (#125 of '146). This screen would have been the second FRE.

20. The motivation to add an immobile diffuser/flow restrictor is to provide a rapid cycle in venting and pumping gas, as taught by '025 (col. 2, lines 39-41), and to reduce minute particle contamination (col. 3, lines 26-28). The motivation to add screen/second immobile FRE in front of pump is to remove particles, as taught by '603, (right col. of page 2, lines 72-75).

21. '146 further teaches the limitations of:

22. Claims 3 and 7: A sub-atmospheric downstream pressure control apparatus as in claim 1 (or 5) further characterized by: an abatement chamber (#210, gas energized

Art Unit: 1792

reactor); a reactive gas source (the second #235, col. 8, lines 12-13) connected in serial fluidic communication upstream from said abatement chamber; and an abatement element (#226a-b, electrode) located within said abatement chamber.

23. '146 does not teach the limitations of:

24. Claim 3: A third FRE connected in serial fluidic communication downstream from said PCC (#85); an abatement chamber connected in serial fluidic communication upstream from said third FRE

25. Claim 7: A third FRE connected in serial fluidic communication downstream from said PCC (#85); an abatement chamber connected in serial fluidic communication upstream from said third FRE

26. '146 further teaches a throttle valve at the inlet #211 to prevent backflow (col. 6, lines 35-38). At the time the invention was made, it would have been obvious to a person of ordinary of skill in the art to have added an additional throttle valve between the outlet (#212, Fig. 4) and pumps (#125) to further prevent backflow of effluent (#100). This additional throttle valve would have been a third FRE downstream from said PCC(#85) and the abatement chamber (#210) upstream from said third FRE.

27. Motivation would have been to further prevent backflow of effluent, as taught by '146 (col. 6, lines 35-38).

Art Unit: 1792

28. '146 discloses the claimed invention except for an additional throttle valve. It would have been an obvious matter of design choice to duplicate the throttle valve, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

29. Claims 1-2 and 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over '146, in view of '025 and '603 (note the mapping is different from the rejection above).

30. '146 teaches the limitations of:

31. Claim 1: A sub-atmospheric downstream pressure control apparatus (Fig. 4, abatement system #200, col. 8, line 26, part of the system of Fig. 1, including the throttle valve #82), characterized by: a pressure control chamber (PCC) (#210, gas energized reactor) located in serial fluidic communication downstream from said first FRE; a gas source (one of the #235, col. 7, lines 37-40); and a flow controlling device (one of the control valve #240) in serial fluidic communication downstream from said gas source and upstream from said PCC.

32. Claim 5 (besides the limitations of claim 1 right above): A wafer processing apparatus comprising a process chamber (Fig. 1, #25), said apparatus characterized by; a process reactive gas supply line (line connects between #70 and nozzle #72) from a process gas source (#70, col. 3, lines 36-38) in serial fluidic communication upstream from said process chamber; an upstream flow control device (the valve as shown in Fig.

Art Unit: 1792

1, not labeled) located in serial fluidic communication upstream from said process chamber and downstream from said process gas source.

33. Claims 2 and 6: A sub-atmospheric downstream pressure control apparatus as in claim 1 (or 5) further characterized by: a reactive gas source (the second #235, col. 8, lines 12-13) connected in serial fluidic communication upstream from said PCC; and an abatement element (#226a-b, electrode) located within said PCC.

34. '146 does not teaches the limitations of:

35. Claim 1: a first flow restricting element (FRE), wherein said first FRE is an immobile flow restricting element; a second FRE located in serial fluidic communication downstream from said PCC, wherein said second FRE is an immobile flow restricting element.

36. Claim 5: a first flow restricting element (FRE) located in serial fluidic communication downstream from said process chamber, wherein said first FRE is an immobile flow restricting element; a second FRE located in serial fluidic communication downstream from said PCC, wherein said second FRE is an immobile flow restricting element.

37. '025 is an analogous art in the field of manufacturing of semiconductor devices using plasma (field of the invention; similar to '146, col. 1, lines 53-56 and col. 3, line 13), particularly in rapid cycling of venting and pumping gas (col. 2, lines 39-41; similar

Art Unit: 1792

to '146 effluent gas treatment, abstract). '025 teaches an immobile diffuser/flow restrictor (#200, Fig. 4A or 4B) at the bottom of the chamber (see Fig. 3A).

38. '603 is an analogous art in the field of turbo pump (title, right col. of page 2, line 40). '603 teaches a screen/flow restricting element (#44, Fig. 7, right col. of page 2, lines 65 to 75).

39. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have added a diffuser/first immobile flow restrictor, as taught by '025, to the bottom of chamber in Fig. 1 or 146, or upstream of Fig. 4 of '146. This diffuser/immobile flow restrictor would have been the first FRE. Furthermore, to have added a screen in front of pump (#125 of '146). This screen would have been the second FRE.

40. The motivation to add an immobile diffuser/flow restrictor is to provide a rapid cycle in venting and pumping gas, as taught by '025 (col. 2, lines 39-41), and to reduce minute particle contamination (col. 3, lines 26-28). The motivation to add screen/second immobile FRE in front of pump is to remove particles, as taught by '603, (right col. of page 2, lines 72-75).

Response to Arguments

41. Applicant's arguments filed on 11/24/2008 have been fully considered but they are not persuasive.

Art Unit: 1792

42. In regarding to advisory action (10/16/2008), Applicant's argued that some paragraphs are factual and the examiner to re-read the declaration, see the third paragraph to page 6 to the top of page 7, by pointing out one specific example "to the problems with throttle valves and why one skilled in the art would not use a diffuser 200 as shown in the '025 patent in specific places in the '146 patent" are not conclusionary statement, but a factual statement.

This argument is found not persuasive after re-reading the declaration.

All paragraphs pointed out by the Applicant have already been addressed in the Advisory action. It is the interpretation and conclusion drawn by the declarant from those factual statements that are merely opinion and therefore lack probative value.

As to Applicant's specific example, originally item 16 of the declaration (10/06/2008), which is "one skilled in the art would not think such a diffuser could replace a throttle valve" which is addressed in item d of the advisory action (10/16/2008); this "declaration" is the same as Applicant's arguments/remarks addressed in item 3 of the advisory action (10/16/2008). Namely, the examiner's rejection is based on the addition to diffuser, not replacement of throttle valve.

The examiner considers the above example "to the problems with throttle valves and why one skilled in the art would not use a diffuser 200 as shown in the '025 patent in specific places in the '146 patent" an argument, not a factual statement, no matter stated by Applicant's representative or by Applicant or by delcarant. Such statement has no probative value (see MPEP 716.01(b) and (c)).

Art Unit: 1792

43. In regarding to 35 USC 103(a) rejection of various claims, Applicant's argument is the amended claim overcomes the rejection, see the second complete paragraphs of page 7 to the top of page 8.

This argument is found not persuasive in light of the new ground of rejection above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KEATH T. CHEN whose telephone number is (571)270-1870. The examiner can normally be reached on 6:30AM-3 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on 571-272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Application/Control Number: 10/563,519
Art Unit: 1792

Page 13

/K. T. C./
Examiner, Art Unit 1792
/Ram N Kackar/
Primary Examiner, Art Unit 1792